

10/526298

CLAIM AMENDMENTS

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Amended claims: 2; and 4-17.

1. (Original) A method for inhibiting formation of hydrocarbon hydrates in a mixture comprising water and hydrate-forming guest molecules, the method comprising contacting the mixture with a composition which comprises at least one dendrimeric compound having a number average molecular weight of at least 1,000 atomic mass units (amu); and at least one small molecular weight species having less than 1,000 amu, selected from the group consisting of polyalkyleneimine, polyallylamine, starch, sugars, and polymers or copolymers of vinyl alcohol or allyl alcohol, where the composition amount is effective in inhibiting formation of the hydrocarbon hydrates in the mixture.

2. (Currently Amended) The method of claim 1 where the dendrimeric compound is selected from the group consisting of branched and crosslinked polymers having at least one acyclic or cyclic pendant group containing from 3 to 7 carbon atoms, and said branched and crosslinked polymers also containing a heteroatom selected from the group consisting of ~~N, O, and S~~ nitrogen, oxygen, and sulfur, and mixtures thereof.

3. (Original) The method of claim 2, in which the dendrimeric compound is a condensation polymer containing ester groups and at least one amide group in the backbone, having at least one hydroxyalkylamide end group and having a number average molecular weight of at least 1000 amu.

4. (Currently Amended) The method of ~~any one of claims 1 to 3~~, in which the small molecular weight species comprises ~~is based on~~ polyalkyleneimine, ~~in particular polyethyleneimine~~.

5. (Currently Amended) The method of ~~any one of claims 1 to 4~~, in which the small molecular weight species is ~~modified to contain~~ at least one acyclic or cyclic pendant group containing from 3 to 7 carbon atoms.
6. (Currently Amended) The method of ~~any one of claims 1 to 5~~, in which the composition comprises at least one surfactant.
7. (Currently Amended) The method of claim 6 where the surfactant comprises is a cationic, anionic or nonionic surfactant selected from the group consisting of polyoxyethylene ethers, sorbitans, long chain alcohols, sulphates, diols, fatty acids, alkylated ammonium compounds, phosphonium compounds, sulphonium compounds and mixtures thereof, ~~preferably alkylated quaternary ammonium compounds~~.
8. (Currently Amended) The method of ~~any one of claims 1 to 7~~, in which the composition comprises
from 0.1 to 2 wt% of the at least one dendrimeric compound;
from 0.1 to 2 wt% of the at least one small molecular weight species having less than 1,000 amu; and
from about 10 to about 3000 ppm of ~~the~~ at least one surfactant.
9. (Currently Amended) A composition for inhibiting formation of hydrocarbon hydrates which comprises at least one dendrimeric compound having a number average molecular weight of at least 1,000 atomic mass units (~~amu~~); and
at least one small molecular weight species having less than 1,000 ~~amu~~ atomic mass units, selected from the group consisting of polyalkyleneimine, polyallylamine, starch, sugars, and polymers or copolymers of vinyl alcohol or allyl alcohol.
10. (Currently Amended) The composition of claim 9 in which the dendrimeric compound is selected from the group consisting of branched and crosslinked polymers having at least one acyclic or cyclic pendant group containing from 3 to 7 carbon atoms, and said ~~linear~~, branched and crosslinked polymers ~~also containing~~ comprising a

heteroatom selected from the group consisting of N, O, and S nitrogen, oxygen, and sulfur, and mixtures thereof.

11. (Currently Amended) The composition of claim 10, in which the dendrimeric compound ~~is~~ comprises a condensation polymer containing ester groups and at least one amide group in the backbone, having at least one hydroxyalkylamide end group, and having a number average molecular weight of at least 1000 ~~amu~~ atomic mass units.

12. (Currently Amended) The composition of ~~any one of claims 9 to 11~~, in which the small molecular weight species ~~is based on~~ comprises polyalkyleneimine, ~~in particular polyethyleneimine~~

13. (Currently Amended) The composition of ~~any one of claims 9 to 12~~, in which the small molecular weight species ~~is modified to contain~~ comprises at least one acyclic or cyclic pendant group containing from 3 to 7 carbon atom

14. (Currently Amended) The composition of ~~any one of claims 9 to 13~~, in which the composition further comprises at least one surfactant.

15. (Currently Amended) The ~~method composition~~ of claim 14, ~~in which~~ wherein the surfactant ~~is~~ comprises a cationic, anionic or nonionic surfactant selected from the group consisting of polyoxyethylene ethers, sorbitans, long chain alcohols, sulphates, diols, fatty acids, quaternary ammonium compounds and mixtures thereof.

16. (Currently Amended) The composition of ~~any one of claims 9 to 15~~, in which the composition comprises
from 0.1 to 2 wt% of the at least one dendrimeric compound;
from 0.1 to 2 wt% of the at least one small molecular weight species having less than 1,000 atomic mass units, ~~amu~~; and, optionally
~~from about 10 to about 3000 ppm of the at least one surfactant.~~

17. (Currently Amended) A hydrate inhibited mixture comprising:
water;_i
hydrate-forming guest molecules;_i and,
a composition comprising: ~~where the composition comprises~~
at least one dendrimeric compound having a number average molecular weight of at least
1,000 atomic mass units (~~amu~~); and,
at least one small molecular weight species having less than 1,000 ~~amu~~ atomic mass
units, selected from the group consisting of polyalkyleneimine, polyallylamine, starch,
sugars, and polymers or copolymers of vinyl alcohol or allyl alcohol; ~~and, optionally, at~~
~~least one surfactant,~~
~~where~~ wherein the composition is present in a concentration effective to inhibit hydrate
formation in the mixture.

18. (Original) The hydrate inhibited mixture of claim 17, in which the
hydrate-forming guest molecules are selected from the group consisting of methane,
ethane, ethylene, acetylene, propane, propylene, methylacetylene, n-butane, isobutane, 1-
butene, trans-2-butene, cis-2-butene, isobutene, butene mixtures, isopentane, pentenes,
natural gas, carbon dioxide, hydrogen sulphide, nitrogen, oxygen, argon, krypton, xenon,
and mixtures thereof.